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2. *Notes on the Rivers in Northern Formosa.* By HENRY KOPSCH, F.R.G.S.

LONG as the island of Formosa has been known to navigators, and though visited by Europeans centuries ago, our knowledge of its geography at this period is exceedingly meagre. The extreme skirt of the island is all with which we are as yet acquainted, and that but imperfectly. Though the northern and southern ends of the island were settled by the Dutch as early as 1624, who fortified themselves at Tamsui and Taiwan-fu, the only traces of their former occupation of the island are the ruins of their forts—Fort Zelandid at An-ping, and the Red Fort at Tamsui, with a few cuttings of names found in a cave at Palm Island, Kelung, copies of which I subjoin, deeming them worthy of preservation. The names found were—

HANS HUBENER.	HANS HENRICK ROTENPOVG.					
1664 } <table><tr><td>A</td><td>E</td></tr></table> }	A	E	JACOB BOSCH. <table><tr><td>B</td><td>P</td><td>F</td></tr></table> }	B	P	F
A	E					
B	P	F				
SCHELCK. } 1666. }	1664.					
NICOLUS GROS. A C 1667.						

A residence in Formosa naturally inspires one with a desire to become better acquainted with the interior of this unknown island; but the explorer is sorely disappointed to find that admission to this secluded spot is almost impossible, owing to the presence of a hostile race of savages throughout the island, who glory in the murder of Chinese, and since in these latitudes it is difficult to travel without such assistance, one is debarred from penetrating the interior.

Knowing that any attempt to make a hasty entry into the savage territory would be fruitless, we determined to commence our peregrinations away from the savage territory, which also offers a large and interesting field. The north end of the island is well interspersed with streams, few of which are marked on any maps, and those that are we found to be placed incorrectly.

We will commence an account of our voyages by giving a description of the native boats employed inland, their construction being somewhat peculiar, but so well adapted for navigating shallow rivers and ascending rapids that a short notice on their properties may be of interest and use to explorers. In the construction of vessels of light draught, combining comfort and capacity, the Chinese are not backward. The dimensions of our large boat were as follows:—Length 35 feet, beam 7 feet, depth 3 feet, mast 30 feet high, with a bamboo-ribbed sail. They are entirely built of camphor-wood planks one inch thick without a join from stem to stern, and, in addition to the planks being nailed to the ribs, nails are driven in—perpendicularly (a fashion with Chinese boat-builders)—to fasten the planks together. The boat has in all 7 ribs, the first from the bow being built up to form a watertight compartment when required, and the whole is decked over with loose planks. The first rib from the stern is also built up into a compartment in which the small clay cooking-furnace is stowed away; the centre of the boat is thus left for passengers or cargo. Chinese naturally sit *à la Chinois*, and they sleep in their boat athwartship; but the mat-covering may be raised high enough for an ordinary sized man to stand up under. Our boat, with six men in her, and some 300 lbs. of baggage, &c., drew 6 inches of water. Two natives composed the crew when sailing or pulling in open water; but on ascending rapids a third man is engaged, to keep the bow up-stream—two being required to push at the bow, while a third pushes astern, thus the flat-bottomed craft ascends the rapids.

Light as the draught of these boats may appear, in some parts we had to procure smaller ones, which may be lifted by four men over any obstacle. Being flat-bottomed, they can only sail before the wind, and their tall mast and large spread of canvas enables them to do so with great speed. For travelling in warm latitudes they are very comfortable and commodious.

In December, 1867, we left Tamsui with a view of exploring some of the affluents of the stream known as the Tamsui River, which debouches into the sea at *Hu-wei* (Tamsui). The first town we reach is *Méng-ka* (Banca), the commercial capital of the district, and residence of the chief authority. The voyage took about four hours, an unusually long time, we being unfavoured by wind, and the passage is much prolonged by having to steer a very winding course to avoid sand-banks. Beyond *Méng-ka*, which is distant about 12 miles from *Hu-wei*, navigation for junks ceases, and that city can only be reached by large boats at high water, there being less than 3 feet in some parts of the river at low water; the tide, however, rises from 7 to 9 feet. Opposite *Méng-ka* the river branches off to the s.s.w. leading to *To-ka-ham*; but we followed up the south-east branch, intending to ascend the first affluent we met. Rapids of small size begin to appear soon after leaving *Méng-ka*, and become more numerous and shallow on approaching the village of *Ku-lun-an*, where the river increases to a considerable width, with endless brawling rapids and dry patches dividing its course. *Ku-lun-an* is a picturesque little village situated on the left bank, and is surrounded by clumps of feathery bamboos.

The neighbourhood was richly cultivated with sugar-cane, hemp, and vegetables, and considerable boat traffic was observed on the river. Fish of an excellent quality were procured here, resembling mountain trout. They are caught by dragging a rope with feathers fastened to it, by means of which the fish are attracted and then netted. Continuing our course over shallow but broad water for a short distance we came to an affluent on the right bank, up which we decided to go, the main river we were about to leave heading to *Chín-tam-ki*. At the mouth of the new branch we were greeted by a troublesome rapid which debarred our progress, nor could we manage to pass it without getting out and lending a hand to our crew. Going on for about a mile through the most enchanting scenery, we reached a village called *Kung-tao-mu*, situated at the foot of a pretty green hill about 150 feet high. Here we halted for the night, just far enough from the village to avoid being stared at by inquisitive natives.

The night was perfectly summer-like, and, in fact, the thermometer was standing at "summer heat" during the day. Small flies were troublesome by buzzing round the lights, but no mosquitoes visited us.

The river was as clear as crystal. We did not proceed far the following morning without encountering many rapids, some being too shallow for our large boat to ascend. Luckily, at a small village, we procured two smaller boats, and after transshipping our baggage and servants into one boat, and keeping the other for our own use, we resumed our course. The agriculturists in this vicinity are very well-to-do people: the women and children were clad in gay-coloured garments; the men were strong and healthy-looking fellows. Passing more rapids and shallows we reached *Kiang-pih*, famous for its aqueduct which crosses the river at this village. This useful structure—the labour of many years and cause of much bloodshed between the Chinese and aborigines—was built by a wealthy colonist, named *Ban-Keo-tao*, for the purpose of supplying the commercial town of *Méng-ka* with sweet water (the river water just there being brackish), and to afford easy means of irrigating the land. After going under the aqueduct and through countless rapids we at last reached a good long expanse of clear water free from shallows or rapids, about 50 yards wide, lined with bamboos on each bank. A well-cultivated valley extends for about a mile on each bank of the river, terminating at a high range of wooded hills. This pleasant sailing did not last long, for after passing a tiny village, called *Shih-i-ming*, where dyeing was going on, the river became an endless string of rapids too numerous to be mapped down. The scenery in this vicinity presents every imaginable feature, well meriting the name of Formosa. On the left bank were lofty hills well wooded with pines, while close to the water's edge are immense beds of ferns, bamboos, and

entangled masses of creepers, the *tout ensemble* forming such an enchanting landscape that we named it "Fairy Knoll." Huge boulders lie scattered in the bed of the river and on the banks, one of which is said to rock with the wind. About here we saw coal cropping out of the hills. Most people would denounce this river at its upper end as unnavigable; but, with the admirable boats and perseverance of the Chinese, the ascent is accomplished with comparative ease. Owing to the unusually dry season, there was so little water that in some parts it seemed really impossible to get up such a small but swift stream; still, boats laden with grain were being pushed up by sheer strength.

At about 5 P.M. we reached a small village, called *Pung-a-na*, situated at the foot of a high range of mountains, where the river ends in a mountain torrent, and all navigation ceases.

Learning from the natives that we were not more than two hours' walk from *Liang-kah*, we determined to try and reach it that night, so, procuring a guide, and entrusting our blankets to our coolies with orders to follow, we started off through the mountains on our unknown route. The first part of the road took us along the bed of the river we had just left, after crossing which we climbed up a steep hill covered on its summit with stunted firs and common tea-plants. Before we reached the top of the mountains it began to grow dark, which at once caused us to entertain doubts as to our blankets, &c., following, the road being terribly bad. After walking through jungle, and paddy-fields in the low land, we had to cross a second range of hills equally high, the darkness of the night making it most difficult to keep the path. Half-way up the mountains the inmates of a hamlet kindly provided our guide with a torch, but it was unable to stand the gusts of wind and rain experienced at the hill-tops. Five hours' most unpleasant walking from *Pung-a-na* brought us to a large village, which we hoped was *Liang-kah*, but to our chagrin found it to be *Chin-teng-kah*, some 15 miles down the river. Having ordered our baggage to go to *Liang-kah* it was useless to stay here, so we marched on to the former place, arriving there after a walk of nine hours from *Pung-a-na*. The owner of a rapid-boat most hospitably offered us shelter from the rain, and cooked a meal of rice for us. His kindness did not end here, for he provided us with as much of his bedding as he could spare, upon which the three of us slept. Our baggage was destined never to come by that route, the coolies having refused to cross the hills by night. We returned to Tamsui *viâ* the Ke-lung River.

A graphic description of this river having already appeared in the Society's 'Journal,' vol. xxxiv. p. 8, it will suffice merely to add a few remarks concerning the places of interest along its banks.

About 8 miles from Tamsui, and 4 miles from the river, are the sulphur springs or pits situated in a small sheltered valley in the high range of hills running towards Ke-lung, at an elevation of 450 feet. At the foot of these hills is a good-sized brook of clear warm water, which in November was 105° F., while the air was 72° F., and so strongly impregnated with sulphur that the stones have been changed into a dark-green colour. For curing cutaneous diseases this water is considered very efficacious. The pits consist of about twenty jets of vapour of various sizes, from not larger than the steam from an over-boiling tea-kettle, to columns rising high in the air with great force and deafening noise. As this sulphurous vapour ascends and comes in contact with the air, it condenses in the form of a fine yellow powder, known as the flowers of sulphur, and which accumulates in large quantities around the mouth of the pits. Some of these jets seem to have blown off their encrustment of earth, and are now left in the shape of a natural caldron of boiling lava, which, on overflowing and cooling, covers the rocks and stones with a crust, under which is found a compact mass of sulphur of a soft granular crystalline texture. Clear springs of boiling water are found in every

hole, strongly infused with sulphur. At present the mines are not worked, but formerly many tons were exported.

Opposite Mêng-Ka, as I have before stated, the river branches off to the s.s.w., leading to *Sa-ko-y-ing* and *To-ka-ham*. It is not navigable beyond the latter town, owing to numerous rapids and the presence of savages. The entrance to the *To-ka-ham* river (as we called it) runs through a rich alluvial plain, highly cultivated with rice, peas, sugar, and hemp. Its banks at the mouth are about 1000 yards apart, and from their height one is led to infer that formerly a river of considerable magnitude existed, whereas at present it is only a wide but shallow sheet of water, most tedious and troublesome to navigate, owing to the number of banks and circuitous channel. On the left bank, some 5 miles up, is situated the magisterial town of *Sin Ching*, where conveyances are generally engaged by travellers to *Tuk Cham*. After some miles of the most tedious navigation in the shallowest water imaginable, we were introduced to the rapids, the characteristic feature of Formosan rivers, and found them more formidable on this river than on the Ke-lung, or, as we called the other to the southward, "Henries River." As the traveller ascends the stream, the mountains show less and less signs of cultivation, and are more thickly wooded with firs, bamboos, and tropical plants of magnificent verdure. The bottom of this clear river is formed of boulders the size of a 68-pound shot, thousands of tons being scattered on each side of the river, indicating plainly its former breadth. The sandy soil appears to have been washed away from these boulders towards the junction at *Sin Ching*, where it has accumulated into the form of sand-banks. The river maintains a tolerably equal breadth throughout, that is, above the first rapid. A wooden and stone embankment has been erected to check the encroachment of the water on the cultivated ground, where it is inclined to eat away the banks, to prevent which in many places frames of bamboo filled with boulders are piled along the shores. Many of the rapids on this river are so shallow, but swift, that the boatmen are obliged to erect dams, made by putting large stones into bamboo frames and laying them in the stream to deepen the channel, by narrowing the surface of the water. Towards the head of the river it becomes an unbroken chain of rapids, which appears to defy ascent; yet the industry of the Chinese is sufficient to overcome these impediments of nature, and turbulent streams are made into navigable rivers. The very light draught of the rapid-boats enables them to sail up with a strong breeze, but seldom without the aid of a pole or boat-hook. Not far from *To-ka-ham* the river runs at the foot of a range of mountains some 1000 feet high, where large herds of water-buffalo were feasting on the rich pasture.

Having reached a hamlet at dusk where several boats had anchored, we also came to a halt, it being too difficult to ascend the rapids by dark. The next day we got our small boat and proceeded to the town of *To-ka-ham*, which is situated on a high bluff close to the river, and almost obscured from view by trees. This town defines the limits of Chinese occupied territory, beyond which neither Chinese or aborigines venture to cross, except the former when in search of camphor-wood, in which case a picket of rangers generally escort the wood-cutters to protect them from the savages. The *To-ka-ham* river may be considered as the branch supplying the most water to the Tamsui river. After rain the volume of water is so great and swift that no boats, it is said, can stem the current.

The fall from *To-ka-ham* to the last rapid we estimated at about 150 feet.

Many of the rapids are on such an incline that, to a person looking from his boat above the rapid at others ascending, all but the latter's sail is lost to view.

The line of demarcation between Chinese and savage territory is most striking in this vicinity. To the westward, richly cultivated table-land, with

snug little farms scattered over it, extends to the sea, while on the east, black and impenetrable forests clothe the lofty mountains, affording a good idea of the difficulty, danger, and labour it must have cost to expel the savages from their mountain fastnesses.

3. *A Trip to Kalgan in the Autumn of 1868.* By R. SWINHOE,
H.B.M. Consul, Amoy.

(Communicated by the FOREIGN OFFICE.)

"SIR,

"Takow, Formosa, Jan. 18, 1869.

"On the pleasure trip to Kalgan I made in company with Messrs. Ford and Carles, Student Interpreters, towards the end of September last, before leaving Pekin, I took some notes, which may be of importance in connexion with my present mission, on inland residence and navigation.

"The route we took was through the Tihshing Gate past Tsingho, Shaho, and Changping-Chow to Nankow, a village at the foot of the pass. The road through the pass is so fearfully bad that we were obliged to send our carts, though empty, each in charge of an extra man, and our baggage on donkeys. The pass is about 13 miles long, winding through the hills until the gate of the Great Wall is reached, issuing from which another rough couple of miles brings you to Shato, a small walled village, consisting mainly of inns, and supported by the passenger-traffic of the pass. Donkeys and mules are procurable at Shato, as at Nankow, to help passengers through the terrible pass. Along the pass one notes the remains of a paved way in places; but the greater part of it has long since worn away, and the stones have been forced right and left, leaving a very rough and irregular road, unfit for any wheeled conveyance, and I doubt if any but the strong springless Pekin carts could endure without destruction the jolts and tumbles as they are half-carried half-dragged over the big stones that lie about. A mule-litter is doubtless the easiest, quickest and safest mode of conveyance over the stony region which is traversed on the way to Kalgan. The Keu-yung-kwan, or walled barrier, that is gone through in the pass, is of some interest for the fine old arch that spans the road through it. The inside of this archway, besides the figures in bas-relief it bears, is inscribed with a Sanscrit prayer, represented phonetically in four modes of writing, viz., Sanscrit, Chinese, the Newchi character, and the Paszepa. The Newchi inscription is the only inscription of that quaint character now accessible to students. This character was invented by a scholar under the order of Taetsoo, the first Emperor of the Kin dynasty during the twelfth century. The Newchi were a tribe of Tartars from the mountain-wilds north-east of China, who ruled in China as the Kin dynasty (see Article VIII., by Mr. Wylie, in 'Transactions of China Branch of Asiatic Society, Hongkong,' Part vii., p. 137, 1859). The Paszepa was an alphabet invented by Pashpa, the first of the hierarchy of Dalai Lamas in the Yuen dynasty. A specimen of this writing also occurs in a temple at Shanghae (see Mr. Wylie, Art. III., 'Transactions of the China Branch of the Royal Asiatic Society, Hongkong,' Part v., 1855). At the first gate of the Keu-yung-kwan there is a barrier for the collection of duties. Inside the further gate the Yamèn of the Military Commandant (Toosze) is situated. A wall runs up the hill on each side of the first gate and descends to meet the further gate, thus encircling the barrier town. The Great Wall at the head of the pass is in tolerable condition, and evidently more modern than the wall at Kalgan. Its gate is in ruins and deserted. The country about and beyond Shato is barren and bare, with little cultivation (chiefly of sorghum), and the roads rough and stony as far as Yulin. As you approach Hwailai Hsien, 50 li from Shato, these improve, a small river runs past this town, by the side of which we saw a large herd of camels laden with teas for Russia. The road takes you over